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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/553,951

Applicant(s)

CALCAGNO ET AL.

Examiner

CANDAL ELPENORD

Art Unit

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-38 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17 and 19-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on October 21, 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed January 28, 2009 have been fully considered but they are not persuasive.
2. No claims have been cancelled. Dependent claim 19 has been amended.
3. The Applicant alleged that the combination of Lilja '847 and Chen '933 does not teach or suggest the claimed features wherein "a type of radio access used by at least one base radio station is updated to support the multi-carrier access used in the at least one microcell" or updating by at least one base radio station".

In response, the Examiner respectfully disagrees because the combination when considered as whole does in fact teach the Applicant claimed invention as broadly interpreted. The Applicant is alleging that Chen '933 teaching features involving a handoff procedure wherein an upgrade from single carrier service to multicarrier services via a handoff (from single to multicarrier base station) is not the functional equivalent to what is being claimed. The Examiner asserts that Chen '933 discloses the above claimed features (see, handoff from single carrier service to multi-carrier services (i.e. multicarrier compliant base station) when the mobile unit travels from large service areas (i.e. macrocell) to small service areas (i.e. microcell), col. 10, lines 8-17, col. 11, lines 47-62).

In view of the above reasons, given the well-established combinational teachings of Lilja '847 and Chen '933, one skilled in the art would arrive at the

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claimed invention. Additionally, one skilled in the art would be motivated to upgrade the data packet service from macrocell to microcell in order to prevent denial of service to the mobile unit when it roams outside the single carrier service area which in turns provides efficient use of network resources. A type of radio access was broadly interpreted since it was explicitly defined in the claim.

Note: For argument sake consider (US Patent 6,256,500 B1) as an illustrative example, updating the service from the macrocell to the microcell when the particular service is not provided in the macrocell or predetermined service criteria is not met when the mobile units roams around is well-known in the art as evidenced in (US Patent 6,256,500 B1, col. 3, lines 34-65, fig. 3, fig. 2A to fig. 2B, col. 5, lines 14 to col. 7, lines 67).

In view of the above reasons, the rejections of independent claims as well dependent claims are maintained as follows.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. **Claims 17, 20-21, 32-34, 36-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilja et al (US 6,456,847 B1) in view of Chen et al (US 7,151,933 B2).

Regarding claim 17, Lilja '847 discloses a radio telephony network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) supporting at least one link of a radio channel (fig. 3, Radio

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Transmission Links 314, col. 4, lines 16-32) for a packet data transmission service (Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40), the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) comprising: a plurality of network controllers (fig. 2, see first and second Radio Network Controllers 306, col. 4, lines 39-49), each network controller (fig. 2 to fig. 3, fig. 4, 4a, see lub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) being connected via an interface (fig. 2 to fig. 3, fig. 4, 4a, see lub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) to at least one base radio station (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, lub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) the at least one base radio station (fig. 2 to fig. 3, fig. 4, see Base Station 304, col. 4, lines 27-38) supervising at least one macrocell (fig. 2 to fig. 4, fig. 7a, see first Base station(BTS1) coverage area of a macrocell, col. 7, lines 58-67); and at least one base radio microstation (fig. 2, Radio Subsystem connecting to a radio controller, col. 3, lines 61 to col. 4, lines 4) connected to a network controller (fig. 2, see RNC connecting to radio subsystem) in the plurality of network controllers (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) via an interface (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, lub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) the at least one base radio station (fig. 2 to fig. 3, fig. 4, see Base Station 304, col. 4, of the same type as that connecting the at least one base radio station (fig. 2 to fig. 3, fig. 4, see

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Base Station 304, col. 4, lines 27-38) to the network controllers (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), the said at least one base radio microstation (fig. 7a, BTS2 that services a microcell within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) supervising at least one microcell (fig. 7a, BTS2 that services a microcell within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) incorporated in the at least one macrocell (see, "microcells 702 situated within the macrocell", col. 7, lines 58-67) and centered at a point different from the point at which the at least one macrocell is centered (fig. 4a, fig. 7a, see microcell situated away from the macrocell), the at least one base radio microstation providing the packet data transmission service in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) on the at least one link of the radio channel (fig. 3, Radio Transmission Links 314, col. 4, lines 16-32), and the at least one base radio station (fig. 2 to fig. 4a, see BTS1) providing the packet data transmission service in areas of the at least one macrocell (fig. 2 to fig. 4a, fig. 7a, see BTS 1 services the macrocell, col. 7, lines 58- to col. 8, lines 4) other than in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7).

Regarding claim 20, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein each base radio microstation (fig. 2 to fig. 4a, see BTS1, BTS2 connecting to the respective Mobile Switching Center, col. 4, lines 57 to col. 5,

lines 10) comprises a central switch (fig. 2 to fig. 4a, see Mobile Switching Centers, col. 4, lines 57 to col. 5, lines 10) and a plurality of access ports (fig. 2, see Base Station nodes B providing data transmission access to the User Equipment Ue, col. 4, lines 16-26) connected to said central switch (fig. 2 to fig. 4a, see Mobile Switching Centers, col. 4, lines 57 to col. 5, lines 10) by a cable (fig. 2 to fig. 4a, see transmission/communication link connecting the radio access components).

Regarding claim 21, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein each base radio microstation (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) comprises a protocol structure (fig. 2 to fig. 4a, , UMTS/UTRAN structure, col. 3, lines 61 to col. 4, lines 4) including a first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4) and a second protocol level (fig. 2 to fig. 4a, see Radio Network controllers controlling the base stations, base station with control entity, col. 4, lines 21-32) located above said first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4), said first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4) being a physical level (fig. 2 to fig. 4, see components of the radio access systems) and said second protocol level being a data transmission level (fig. 2 to fig. 4a, Control Entity for connecting speech and data, col. 4, lines 39-44).

Regarding claim 32, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one link of said radio channel is a downlink (fig. 4a, fig. 7a, see BTS1 and BST2 services the mobile station on the down link channel using a frequency band, col. 8, lines 1-7).

Regarding claim 33, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein the at least one microcell corresponds to a high traffic area within the at least one macrocell (Noted: microcells placed in areas with a high traffic load, microcell situated within the macrocells, col. 7, lines 58-67).

Regarding claim 34, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein the at least one link of the radio channel comprises at least one downlink (fig. 4a, fig. 7a, see BTS1 and BST2 services the mobile station on the down link channel using a frequency band, col. 8, lines 1-7).

Regarding claim 36, Lilja '847 discloses a method of providing a packet data transmission service in a network (noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40, Noted: fig. 4a to fig. 4b, 6a to fig. 6c, see multiple frequency bands being used for data transmission between the base stations and the mobile station terminals, col. 5, lines 15-32, col. 8, lines 17-33, fig. 1 to fig. 2, see the Radio Access network), the network

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(fig. 1 to fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) comprising at least one macrocell (fig. 2 to fig. 4, fig. 7a, see first Base station(BTS1) coverage area of a macrocell, col. 7, lines 58-67); and at least one microcell (fig. 7a, BTS2 that services a microcell within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) located within the at least one macrocell (see, "microcells 702 situated within the macrocell", col. 7, lines 58-67), the method (noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40, Noted: fig. 4a to fig. 4b, 6a to fig. 6c, see multiple frequency bands being used for data transmission between the base stations and the mobile station terminals, col. 5, lines 15-32, col. 8, lines 17-33, fig. 1 to fig. 2, see the Radio Access network) comprising: providing, in the at least one macrocell, the packet data transmission service using a first type of radio access (fig. 2 to fig. 4a, fig. 7a, see BTS 1 services the macrocell, col. 7, lines 58- to col. 8, lines 4); providing, in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7).

Regarding claim 37, Lilja '847 discloses the method (Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40), wherein the first type of radio access is CDMA radio access (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26, noted: WCDMA cellular system that enables data transmission between mobile and base station over a wireless link, col. 2, lines 46-59).

Lilja '847 discloses all the claimed limitations with the exception of being silent about the claimed features:

Regarding claim 17, the at least one base radio microstation providing the packet data transmission service in the at least one microcell on the at least one link of the radio channel using a multi-carrier radio access, wherein a type of radio access used by at least one base radio station providing the packet data transmission service in the at least one macrocell is updated to support the multi-carrier radio access used in the at least one microcell.

Regarding claim 36, providing, in the at least one microcell, the packet data transmission service using a multi-carrier radio access different from the first type of radio access; and updating at least one base radio station providing the packet data transmission service from using the first type of radio access to using the multi-carrier radio access.

However, Chen '933 from the same field of endeavor discloses the above claimed features:

Regarding claim 17, the at least one base radio microstation (fig. 1 to fig. 3, see, Base Station Controller 114, col. 9, lines 55-67, fig. 4 to fig. 5, see handing-off by the remote station (i.e. mobile terminal) from a single carrier services to multi-carrier services, col. 10, lines 1-17) providing the packet data transmission service in the at least one microcell (fig. 4 to fig. 5, see Base Station 3 providing coverage in the small services with respect to data transmissions, col. 9, lines 54-63) on the at least one link of the radio channel (fig. 1 to fig. 3,

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see wireless link used the base station and the mobile station to communicate over the forward and the reverse link) using a multi-carrier radio access (noted: multi-carrier data services in small areas provided by the BS3 of fig. 4, col. 9, lines 54-58), wherein a type of radio access used by at least one base radio station providing the packet data transmission service in the at least one macrocell is updated to support the multi-carrier radio access used in the at least one microcell (noted: updating the single-carrier services to multi-carrier services wherein the single-carrier services are provided in large coverage areas and the remote station (i.e. mobile station roams around), col. 9, lines 55-67, col. 10, lines 1-33, see, switching from single carrier to multi-carrier services, col. 12, lines 1-20, col. 11, lines 1-23).

Regarding claim 36, providing, in the at least one microcell (fig. 4 to fig. 5, see Base Station 3 providing coverage in the small services with respect to data transmissions, col. 9, lines 54-63), the packet data transmission service using a multi-carrier radio access different from the first type of radio access (noted: multi-carrier data services in small areas provided by the BS3 of fig. 4, col. 9, lines 54-58, see, switching from single carrier to multi-carrier services, col. 12, lines 1-20, col. 11, lines 1-23); and updating at least one base radio station providing the packet data transmission service from using the first type of radio access to using the multi-carrier radio access (noted: updating the single-carrier services to multi-carrier services wherein the single-carrier services are provided in large coverage areas and the remote station (i.e. mobile station roams

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around), col. 9, lines 55-67, col. 10, lines 1-33, see, switching from single carrier to multi-carrier services, col. 12, lines 1-20, col. 11, lines 1-23).

In view of the above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching features of Lilja '847 by using the teaching features as taught by Chen '933 in order to provide hand-off from single carrier to multi-carrier services when the mobile terminals roams from a single-carrier coverage area to a multi-carrier coverage areas as suggested in col. 6, lines 57 to col. 7, lines 16 for motivation.

8. **Claims 22-23, 24-31, 35, 38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilja et al (US 6,456,847 B1) in view of Chen et al (US 7,151,933 B2) as applied to claims 36, 17 above and further view of Li et al (US 6,940,827 B2)

Regarding claim 18, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one base radio microstation (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, lub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4, see Radio Subsystem) provides said packet data transmission service (Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40, (Noted: fig. 4a to fig. 4b, 6a to fig. 6c, see multiple frequency bands being used for data transmission between the base

stations and the mobile station terminals, col. 5, lines 15-32, col. 8, lines 17-33).

Regarding claim 22, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said first protocol level comprises circuit components (fig. 3, Base Station transceiver 308, multiplexer 312, col. 4, lines 27-38, fig. 8 to fig. 9, see modulating and demodulating components).

Regarding claim 23, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said circuit components (fig. 3, Base Station transceiver 308, multiplexer 312, col. 4, lines 27-38, fig. 8 to fig. 9, see modulating and demodulating components) comprise at least one of dedicated circuits and programmable DSPs (Noted: logic circuits and suitable processor, software, ASIC, col. 9, lines 40-47).

Regarding claim 31, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one base radio microstation (fig. 2 to fig. 4, , fig. 7a, see BTS2 providing services to mobile station(MS 11 in the microcell 702, col. 8, lines 1-7) can provide said packet data transmission service(Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40) to at least one user equipment (fig. 3, User Equipment 302) located in the microcell served by said base radio microstation (fig. 2 to fig. 4, , fig. 7a, see BTS2 providing services to mobile station(MS 11 in the microcell 702, col. 8,

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lines 1-7), said user equipment (fig. 2 to fig. 3, see, User Equipment 302) having a protocol structure including a physical level comprising circuit components (fig. 8, Receiving end with a plurality of components such as Analog to Digital Converter 818b, Demodulator 812b for processing received signals, col. 9, lines 1-17).

Lilja '847 and Chen '933 disclose all the claimed limitations with the exception of being silent with respect to claimed features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access.

Regarding claim 19, the multi-carrier access is of the OFDM type.

Regarding claim 22, first protocol level comprises circuit components for processing a multi-carrier radio signal, said multi-carrier radio signal being formed from a plurality of radio carriers associated with data to be transmitted.

Regarding claim 23, wherein said circuit components for processing said multi-carrier radio signal comprise at least one dedicated circuits and programmable DSPs.

Regarding claim 24, the data transmission level comprises an access control sub-level including a logical entity for controlling said multi-carrier radio access.

Regarding claim 25, the logical entity maps logical channels on transport channels.

Regarding claim 26, logical entity implements functions of retransmission of incorrectly received data packets.

Regarding claim 27, logical entity implements scheduling functions.

Regarding claim 28, wherein said access control sub-level controlling the transport of said multi-carrier radio signal between said base radio microstation and the network controller connected to it.

Regarding claim 29, wherein each access port comprises said first protocol level including said circuit components for processing said multi-carrier radio signal.

Regarding claim 30, controlling the transport of said multi-carrier radio signal within said network controller or between said network controller and the base radio microstation connected to it.

Regarding claim 31, a protocol structure including a physical level comprising circuit components for demodulating said multi-carrier radio signal.

Regarding claim 35, the network, wherein the at least one downlink supports orthogonal frequency division multiplexing.

Regarding claim 38, the method, wherein the multi-carrier radio access is OFDM radio access.

However, Li '827 from the same field of endeavor discloses the following features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access ("transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 19, the multi-carrier access ("multiple-subscribers of OFDM", recited in col. 3, lines 57-62) is of the OFDM type (fig. 3 and fig. 4,

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OFDM Transmitter, recited in col. 5, lines 37-49 and "transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 22, first protocol level (fig. 3 and fig. 4 which encompasses physical components) comprises circuit components (fig. 3 and fig. 4, Modulator 404, recited in col. 6, lines 36-58) for processing a multi-carrier radio signal ("processing of n subscribers communications", recited in col. 6, lines 36-58, fig. 3, OFDM Section), said multi-carrier radio signal ("OFDM signal", recited in col. 5, lines 59-67) being formed from a plurality of radio carriers ("Use of frequency bands to receive and transmit", recited in col. 5, lines 50-58 and "subcarriers of OFDM", recited in col. 6, lines 1-20) associated with data to be transmitted (fig. 4, User Data 410, recited in col. 6, lines 47-53).

Regarding claim 23, wherein said circuit components ("processing logic", recited in col. 5, lines 29-360 for processing said multi-carrier radio signal ("process wireless signals in the form of OFDM", recited in col. 5, lines 42-49) comprise dedicated circuits and/or programmable DSPs ("software and dedicated logic", recited in col. 5, lines 29-36).

Regarding claim 24, the data transmission level (fig. 3 and fig. 4, Base Station that uses OFDM Transmitter, recited in col. 6, lines 36-46) comprises an access control sub-level ("Media Access Control/MAC", recited in col. 6, lines 36-46) including a logical entity (fig. 4, MUX as subcarrier allocator", recited in col. 6, lines 47-53) for controlling said multi-carrier radio access ("processing of n subscribers", recited in col. 6, lines 36-46).

Regarding claim 25, the logical entity ("logical unit", recited in col. 5, lines 8-17) maps logical channels ("mapping of clusters to subcarriers", recited in col. 5, lines 8-17) on transport channels ("subcarriers", recited in col. 5, lines 8-17).

Regarding claim 26, logical entity (fig. 4, MUX 480, recited in col. 6, lines 53-67) implements functions of retransmission (fig. 4, FEC 402, recited in col. 6, lines 53-67) of incorrectly received data packets ("allow the receiver to correct user data", recited in col. 6, lines 53-67).

Regarding claim 27, logical entity (fig. 18, Cluster Allocation and Load Scheduling Controller, recited in col. 17, lines 13-27) implements scheduling functions ("load scheduling of user data", recited in col. 17, lines 13-27).

Regarding claim 28, wherein said access control sub-level ("media access control (MAC) layer", recited in col. 8, lines 1-5) for controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col. 17, lines 13-42).

Regarding claim 29, wherein each access port (fig. 3, Communication System using OFDM-access points, recited in col. 5, lines 29-48) comprises said first protocol level (fig. 3, OFDM Transmitter or Receiver, recited in col. 5, lines 29-67) including said circuit components (fig. 3 and fig. 4, MUX 480, Modulators 404, IFFT 405 as the circuit components, recited in col. 6-7, lines 36-67 and 1-9) for processing said multi-carrier radio signal ("OFDM signals", recited in col. 5, lines 59-67).

Regarding claim 30, a frame protocol (fig. 3 and fig. 4, OFDM physical devices, recited in col. 5, lines 29-49) or controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col. 17, lines 13-42).

Regarding claim 31, a protocol structure ("media access control (MAC) layer", recited in col. 8, lines 1-5) including a physical level (fig. 3, 4 and 5, Physical Layer devices such as the IFFT 505, recited in col. 7, lines 41-67) comprising circuit components (fig. 5, Demux 507, recited in col. 8, lines 1-5) for demodulating (fig. 5, Demodulator 504, recited in col. 7, lines 58-66) said multi-carrier radio signal ("demodulating of received OFDM signal", recited in col. 41-66).

Regarding claim 35, the network, wherein the at least one downlink supports orthogonal frequency division multiplexing (noted: OFDM down link is used to increase capacity as shown in fig. 3, col. 3, lines 44-50).

Regarding claim 38, the method, wherein the multi-carrier radio access is OFDM radio access ("Use of frequency bands to receive and transmit", recited in col. 5, lines 50-58 and "subcarriers of OFDM", recited in col. 6, lines 1-20, "OFDM signals", recited in col. 5, lines 59-67, "transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

In view of the above, having the system for providing data transmission service in several geographical areas served by plurality of base stations of Lilja '847, the method for handing between single-carrier services and multi-carrier

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services when the mobile station roams between large and small service areas of Chen '933, and the method and apparatus for providing communication services using orthogonal frequency division multiplexing (OFDM) of Li '827, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Lilja '847 with Chen '933 by using features as taught by Li 827 in order to provide integrated services between CDMA and OFDM which maximizes the system capacity as suggested in col. 3, lines 38-62 for motivation.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miya et al (US 2002/0105932 A1), Yamashita et al (US 6,256,500 B1), Hsu et al (US 2003/0054807 A1) and Lohtia et al (US 7,352,768 B2).

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

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the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CANDAL ELPENORD whose telephone number is (571)270-3123. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Candal Elpenord/

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Examiner, Art Unit 2416

/Kwang B. Yao/

Supervisory Patent Examiner, Art Unit 2416